CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1. (Currently Amended) A motor control circuit for a direct current electric motor having a pair of direct current inputs supplied respectively from negative and positive current sources wherein said motor is actuated to turn a shaft in one of two directions dependant on which polarity of current is being provided to said motor, said control circuit comprising:

a pair of unipolar control circuits wherein ~~at least~~ one of said unipolar control circuits is connected between one of said ~~a respective~~ current sources and a current input to said motor and the other unipolar control circuit is connected between said other current source and another input to said motor, and

wherein ~~at least one of said~~ said pair of unipolar control circuits ~~is adapted to~~ operate said motor in ~~one of said two~~ opposite directions.

Claim 2. (Previously Amended) A motor control circuit according to claim 1 wherein each of said unipolar control circuits is substantially identical.

Claim 3. (Previously Amended) A motor control circuit according to claim 1 wherein each of said unipolar control circuits further comprises:

a solid state switch located between said motor current input and said source of direct current wherein the degree to which said solid state switch allows current to flow to said motor is controlled by an input bias signal to said switch,

a current limiting member for adjusting said input bias signal according to the current flowing through said motor, such that said solid state switch adjusts said input bias to said solid state switch such that less current flows through said motor when a predetermined period of current limiting has occurred.

Claim 4. (Previously Amended) A motor control circuit according to claim 3 wherein said current limiting member further comprises a temperature compensation circuit.

Claim 5. (Original) A motor control circuit according to claim 4 wherein said temperature compensation circuit comprises a thermistor having a negative temperature co-efficient located in said circuit so that as the ambient temperature and control circuit temperature rises the current through the thermistor increases and said input bias signal to said solid state switch is compensated.

Claim 6. (Currently Amended) A motor control circuit according to claim 3 wherein said solid state switch member ~~is arranged to not operate said motor when said current limiting is occurring for a further predetermined time~~ disengages said current flow to said motor when a predetermined period of current limiting has occurred.

Claim 7. (Currently Amended) A motor control circuit according to claim 3 wherein said solid state switch member ~~is arranged to not operate~~ disengages said current flow to said motor when current drawn by said motor exceeds a predetermined threshold current for a predetermined period of time.

Claim 8. (Previously Amended) A motor control circuit according to claim 3 wherein said current limiting member comprises:

a motor current sensing circuit comprising a shunt resistor arranged to carry a proportion of the current flowing through said motor and provide a respective voltage to the base of a bipolar transistor which is arranged to turn on at a predetermined voltage level representative of the current flowing through said motor at which it should be switched off, such that said bipolar transistor turns on when said predetermined voltage level is reached and which decreases the input bias to said solid state switch to lessen the current though said motor.

Claim 9. (Previously Amended) A motor control circuit according to claim 1 wherein at least one of said pair of unipolar control circuits conducts current to complete the circuit to allow said motor to operate.

Claim 10. (Previously Amended) A motor control circuit according to claim 1 wherein at least one of said unipolar control circuits further comprises:

a solid state switch located between said motor current input and said source of direct current wherein the degree to which said solid state switch allows current to flow to said motor is controlled by an input bias signal to said solid state switch,

a current detection member to detect the magnitude of current being drawn through said motor and if said magnitude exceeds a predetermined level for a predetermined time reduce said input to said switch.

Claim 11. (Original) A motor control circuit according to claim 1 wherein current is primarily conducted through said motor.

Claim 12. (New) A motor control circuit for a direct current electric motor comprising:

a pair of direct current inputs supplied respectively from negative and positive current sources, wherein said motor is actuated to turn a shaft in one of two directions dependent on which polarity of current is provided to said motor;

a pair of unipolar control circuits each comprising a solid state switch located between said motor current input and said source of direct current, said solid state switch being adapted to operate said motor in one of two directions, wherein the degree to which said solid state switch allows current to flow to said motor is controlled by an input bias signal to said switch; and

a current limiting member for adjusting said input bias signal according to the current flowing through said motor, such that said solid state switch adjusts said input bias to said solid state switch such that less current flows through said motor when a predetermined period of current limiting has occurred.

Claim 13. (New) A motor control circuit according to claim 12 wherein said current limiting member further comprises a temperature compensation circuit.

Claim 14. (New) A motor control circuit according to claim 13 wherein said temperature compensation circuit comprises a thermistor having a negative temperature co-efficient located in said circuit so that as the ambient temperature and control circuit temperature rises the current through the thermistor increases and said input bias signal to said solid state switch is compensated.

Claim 15. (New) A motor control circuit according to claim 12 wherein said solid state switch member disengages said current flow to said motor when a predetermined period of current limiting has occurred.

Claim 16. (New) A motor control circuit according to claim 12 wherein said solid state switch member disengages said current flow to said motor when current drawn by said motor exceeds a predetermined threshold current for a predetermined period of time.

Claim 17. (New) A motor control circuit according to claim 12 wherein said current limiting member comprises:

a motor current sensing circuit comprising a shunt resistor arranged to carry a proportion of the current flowing through said motor and provide a respective voltage to the base of a bipolar transistor which is arranged to turn on at a predetermined voltage level representative of the current flowing through said motor at which it should be switched off, such that said bipolar transistor turns on when said predetermined voltage level is reached and which decreases the input bias to said solid state switch to lessen the current though said motor.

Claim 18. (New) A motor control circuit for a direct current electric motor comprising:

a pair of direct current inputs supplied respectively from negative and positive current sources, wherein said motor is actuated to turn a shaft in one of two directions dependent on which polarity of current is provided to said motor;

a pair of unipolar control circuits each comprising a solid state switch located between said motor current input and said source of direct current, said solid state switch being adapted to operate said motor in one of two directions, wherein

the degree to which said solid state switch allows current to flow to said motor is controlled by an input bias signal to said switch; and

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a current detection member to detect the magnitude of current being drawn through said motor and if said magnitude exceeds a predetermined level for a predetermined time reduce said input to said switch.